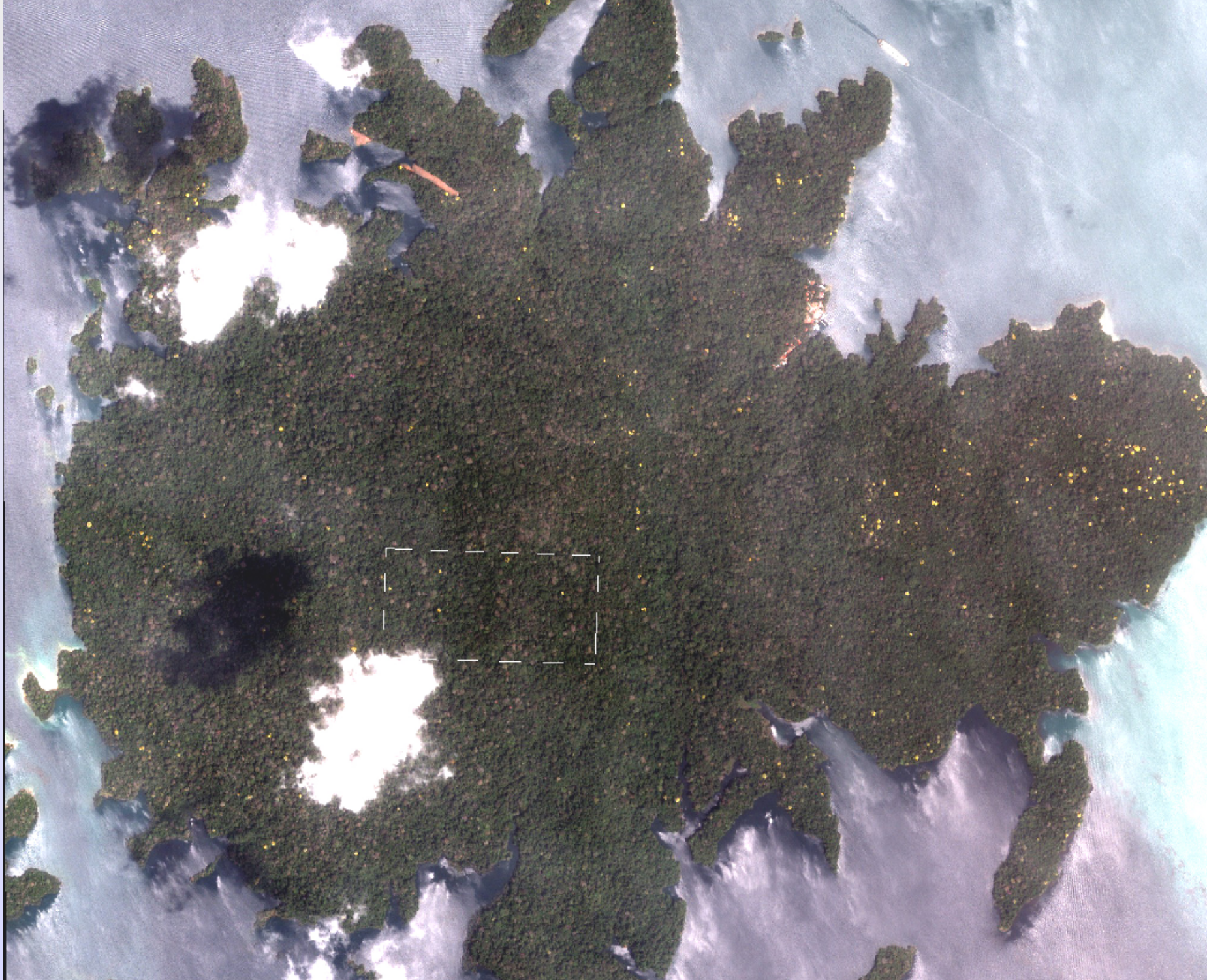


Things I Learned from B.R. Levin

Sign at door of Morrill Hall Lab

1. Wash your hands well?
2. Remove your labcoat?
3. Advance the frontiers of science?
4. Have a good time?

Ralph

Bruce Levin Tribute

plus a bit about ecology and neutral theory

R. Condit
Smithsonian Tropical Research Institute
Center for Tropical Forest Science

Community ecology and population genetics

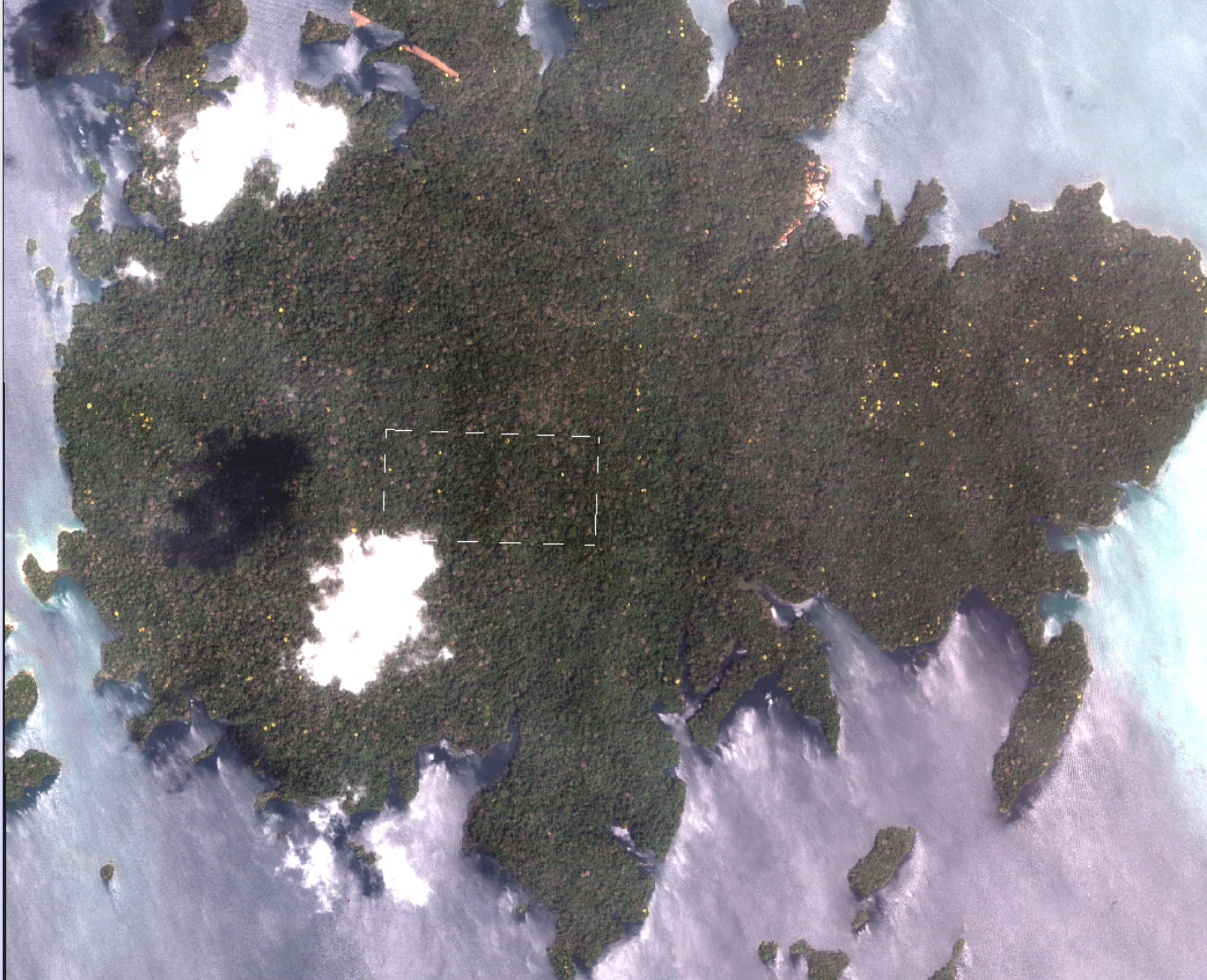
- Species abundance and allele frequency
- Neutral theories of Kimura, Hubbell
- Competitive differences among species vs. fitness differences among alleles

Importance of the neutral theory

- is not neutrality

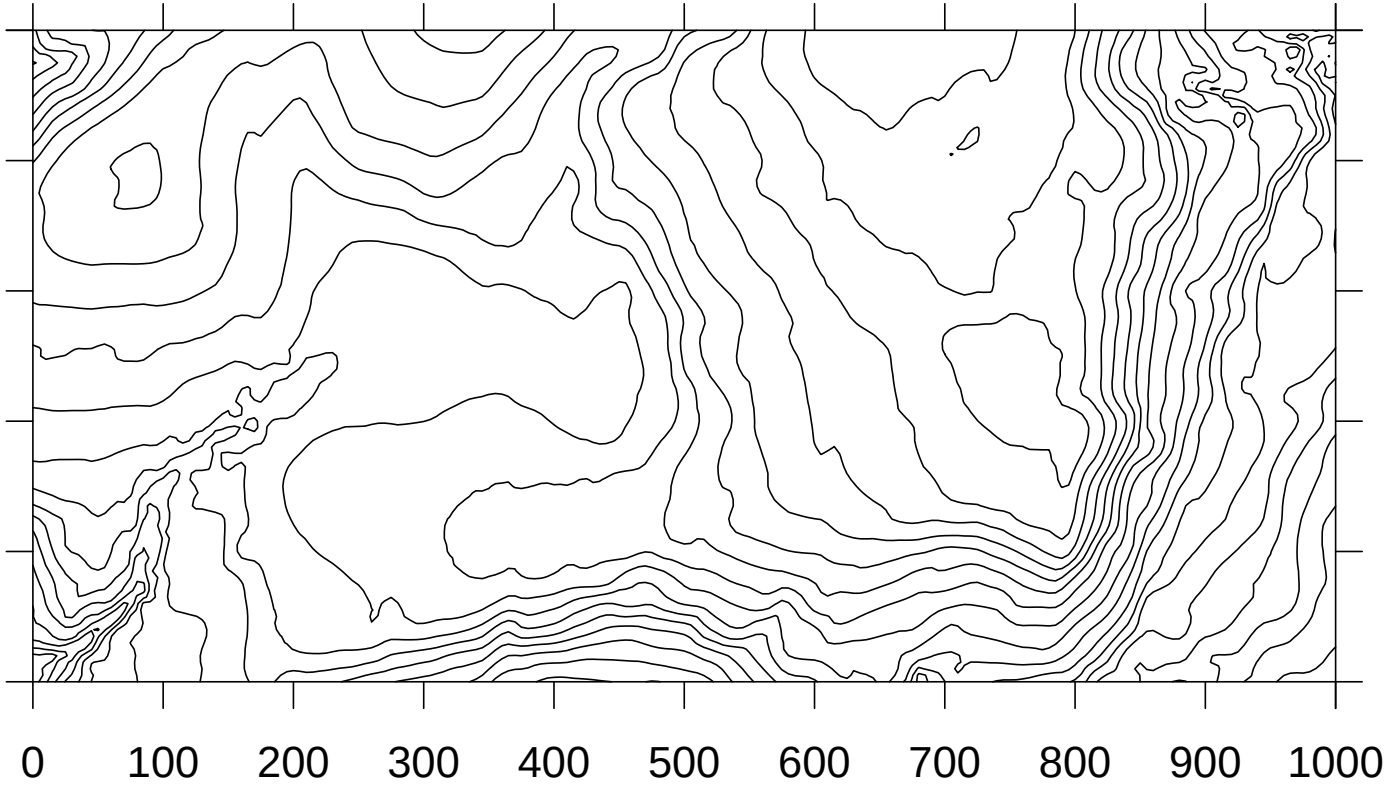
Importance of the neutral theory

- is not neutrality
- it's the focus on species input as cause of diversity
- and on stochastic populations of individuals



Observing species input

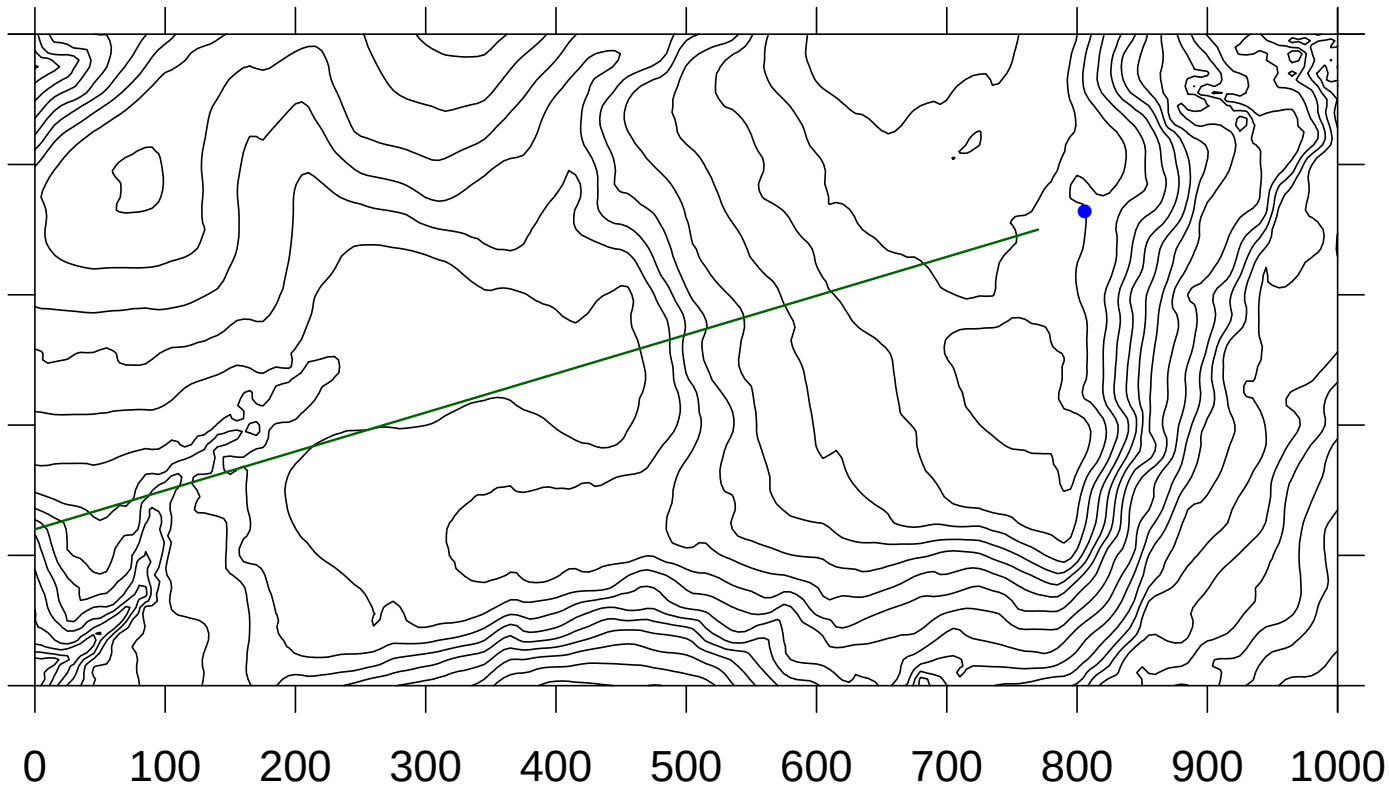
Rauvolfia littoralis in 1990



Observing species input

Rauvolfia littoralis in 1995

The species had never been seen anywhere on BCI before



Species turnover is routine

Take-home message:

Species turnover is observed and maintains diversity
Local stabilizing forces do not maintain diversity

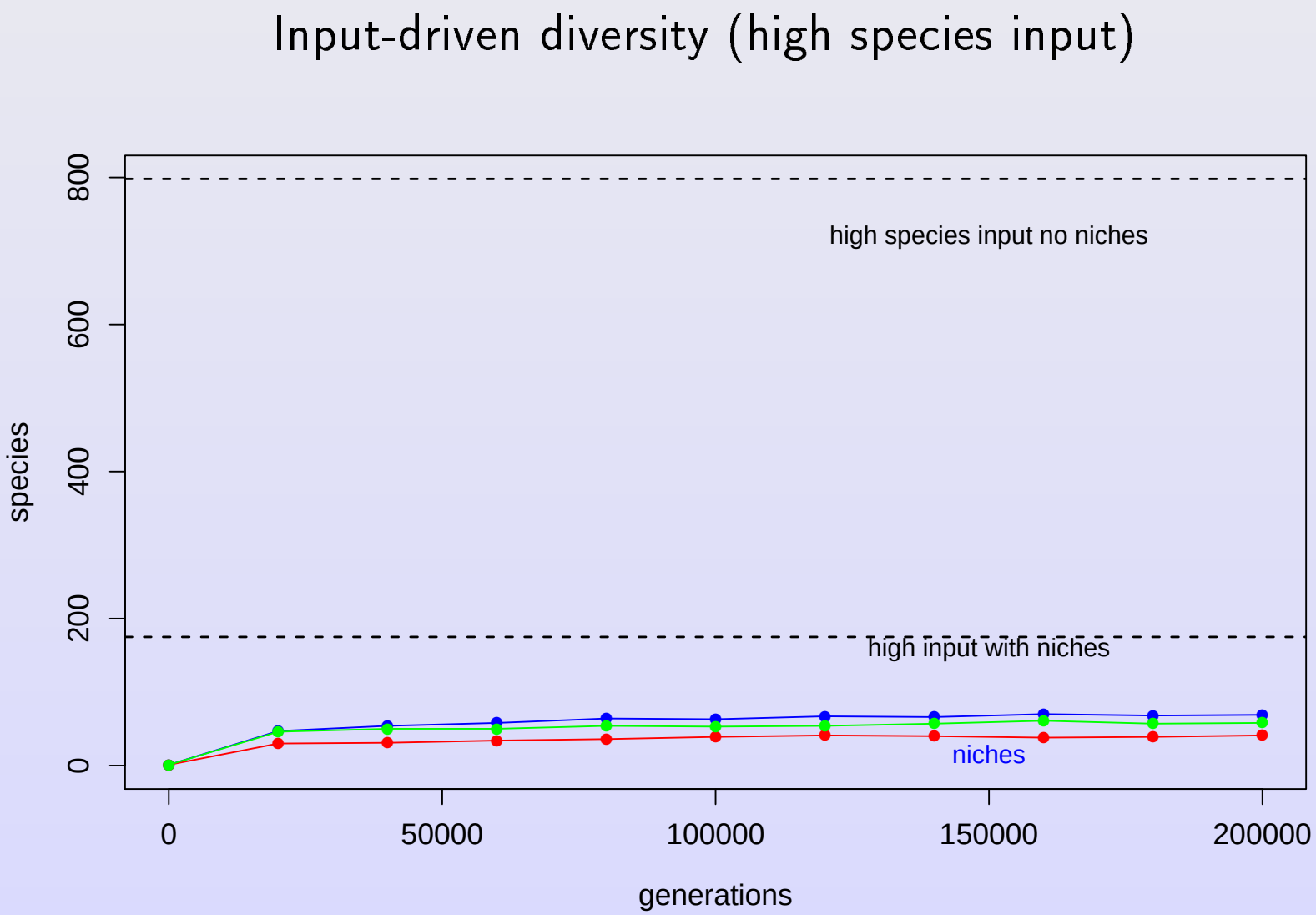
Species abundances and neutral theory

- Abundances of trees in diverse forests always closely predicted by fully neutral model
- Many variations on the model do not alter the prediction
  - Frequency dependence
  - Niche differences among species

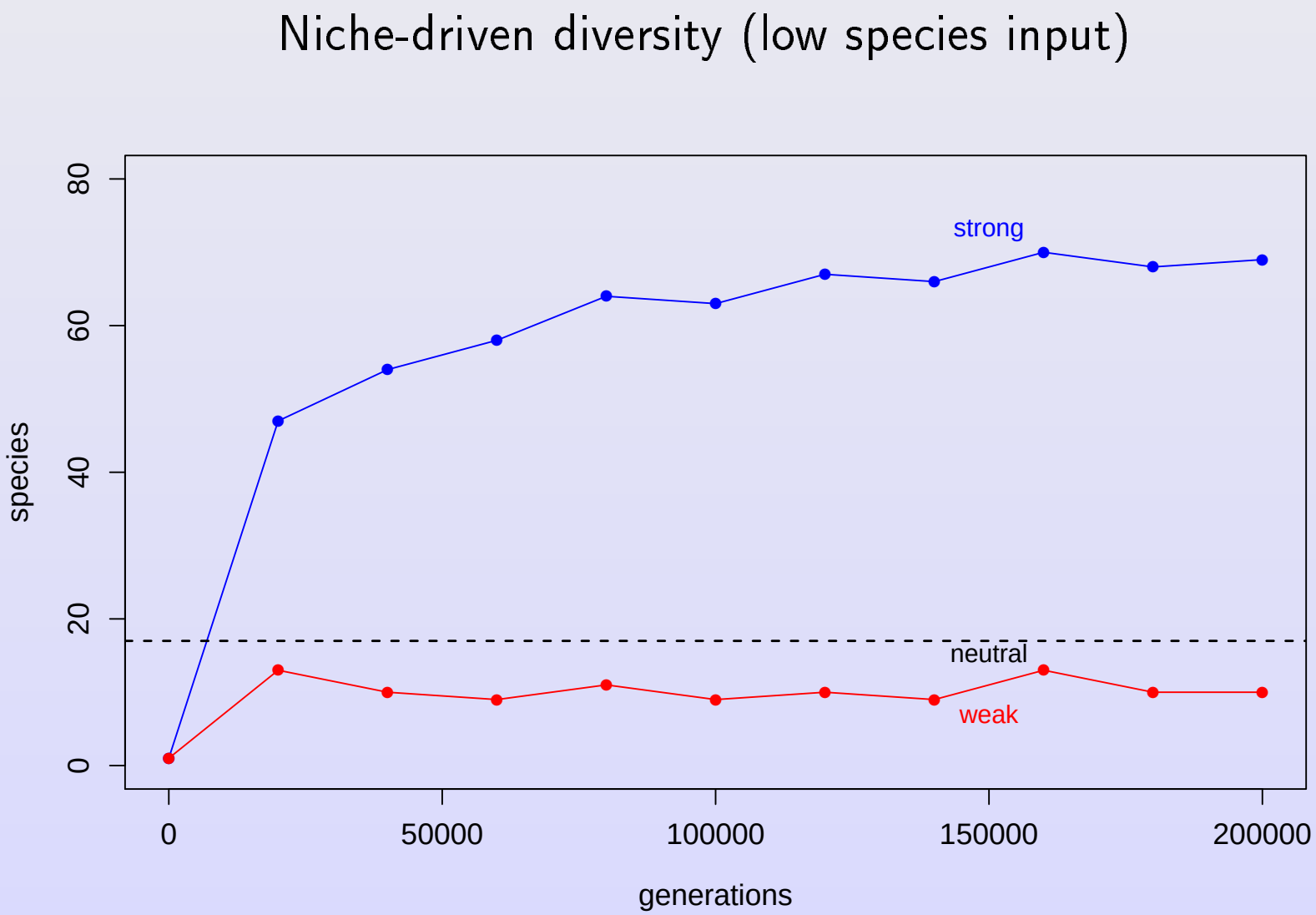
Species abundances and neutral theory

- Abundances of trees in diverse forests always closely predicted by fully neutral model
- Many variations on the model do not alter the prediction
  - Frequency dependence
  - Niche differences among species
- Stochastic dynamics and species input are crucial
  - Species input = mutation
  - Without it, species abundances are not predicted correctly
- Neutral theory predicts correctly by capturing the key features (ideal gas law)

Simulated species diversity



Simulated species diversity



Next questions

- Nearly-neutral theory in ecology: How weak are competitive differences among species to allow many neutral or sub-neutral species to persist?
- How much dispersal (= gene flow) needed to subsidize populations outside their favored environments?

Next questions

- How weak are competitive differences among species to allow many neutral or sub-neutral species to persist?
- How much dispersal (= gene flow) needed to subsidize populations outside their favored environments?

Happy birthday, Bruce!